



COPY OF PAPERS
ORIGINALLY FILED

#3
GP/2161
03.19.02

PTO/SB/21 (08-00)
Approved for use through 10/31/2002. OMB 0651-0031
U.S. Patent and Trademark Office: U.S. DEPARTMENT OF COMMERCE
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

TRANSMITTAL FORM (to be used for all correspondence after initial filing)	Application Number	09/764778
	Filing Date	01/17/2001
	First Named Inventor	Jean-Yves Sireau
	Group Art Unit	2161
	Examiner Name	
Total Number of Pages in This Submission	Attorney Docket Number	23677/15:1

ENCLOSURES (check all that apply)		
<input type="checkbox"/> Fee Transmittal Form <input type="checkbox"/> Fee Attached <input type="checkbox"/> Amendment / Reply <input type="checkbox"/> After Final <input type="checkbox"/> Affidavits/declaration(s) <input type="checkbox"/> Extension of Time Request <input type="checkbox"/> Express Abandonment Request <input type="checkbox"/> Information Disclosure Statement <input checked="" type="checkbox"/> Certified Copy of Priority Document(s) <input type="checkbox"/> Response to Missing Parts/ Incomplete Application <input type="checkbox"/> Response to Missing Parts under 37 CFR 1.52 or 1.53	<input type="checkbox"/> Assignment Papers (for an Application) <input type="checkbox"/> Drawing(s) <input type="checkbox"/> Licensing-related Papers <input type="checkbox"/> Petition <input type="checkbox"/> Petition to Convert to a Provisional Application <input type="checkbox"/> Power of Attorney, Revocation Change of Correspondence Address <input type="checkbox"/> Terminal Disclaimer <input type="checkbox"/> Request for Refund <input type="checkbox"/> CD, Number of CD(s) _____	<input type="checkbox"/> After Allowance Communication to Group <input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences <input type="checkbox"/> Appeal Communication to Group (Appeal Notice, Brief, Reply Brief) <input type="checkbox"/> Proprietary Information <input type="checkbox"/> Status Letter <input checked="" type="checkbox"/> Other Enclosure(s) (please identify below): return receipt postcard RECEIVED FEB 20 2002 Technology Center 2100
Remarks		

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT	
Firm or Individual name	Kassim M. Ferris, USPTO Reg. No. 39,974
Signature	
Date	01/16/2002

CERTIFICATE OF MAILING			
I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, Washington, DC 20231 on this date: 01/16/2002			
Typed or printed name	Sandra Lekar		
Signature		Date	01/16/2002

Burden Hour Statement: This form is estimated to take 0.2 hours to complete. Time will vary depending upon the needs of the individual case. Any comments on the amount of time you are required to complete this form should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Assistant Commissioner for Patents, Washington, DC 20231.

THIS PAGE BLANK (USPTO)



INVESTOR IN PEOPLE

The Patent Office
Concept House
Cardiff Road
Newport
South Wales
NP10 8QQ

RECEIVED

FEB 20 2002

Technology Center 2100

I, the undersigned, being an officer duly authorised in accordance with Section 74(1) and (4) of the Deregulation & Contracting Out Act 1994, to sign and issue certificates on behalf of the Comptroller-General, hereby certify that annexed hereto is a true copy of the documents as originally filed in connection with the patent application identified therein.

I also certify that by virtue of an assignment registered under the Patents Act 1977, the application is now proceeding in the name as substituted.

In accordance with the Patents (Companies Re-registration) Rules 1982, if a company named in this certificate and any accompanying documents has re-registered under the Companies Act 1980 with the same name as that with which it was registered immediately before re-registration save for the substitution as, or inclusion as, the last part of the name of the words "public limited company" or their equivalents in Welsh, references to the name of the company in this certificate and any accompanying documents shall be treated as references to the name with which it is so re-registered.

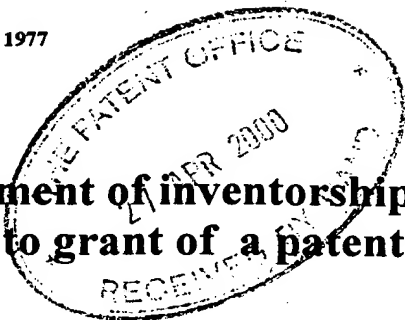
In accordance with the rules, the words "public limited company" may be replaced by p.l.c., plc, P.L.C. or PLC.

Re-registration under the Companies Act does not constitute a new legal entity but merely subjects the company to certain additional company law rules.

Signed

Dated 10 September 2001

THIS PAGE BLANK (USPTO)



**Statement of inventorship and of
right to grant of a patent**

The Patent Office

Concept House
Cardiff Road
Newport
South Wales, NP10 8QQ

1.	Your reference	P14247GB-LH/ATB	
2.	Patent application number (if you know it)	27 APR 2000	0010270.7
3.	Full name of the or of each applicant	Exbet.com Ltd.	
4.	Title of the invention	A Betting System and Method	
5.	State how the applicant(s) derived the right from the inventor(s) to be granted a patent	By virtue of Section 39(1) of the Patents Act 1977	
6.	How many, if any, additional Patents Forms 7/77 are attached to this form?	NONE	
7.	<p>I/We believe that the person(s) named over the page (and on extra copies of this form) is/are the inventor(s) of the invention which the above patent application relates to.</p> <div style="display: flex; justify-content: space-between; margin-top: 20px;"> <div style="text-align: center;"> <p>Signature</p> <p><i>Forrester Ketley & Co.</i></p> <p>Forrester Ketley & Co.</p> </div> <div style="text-align: center;"> <p>Date</p> <p>25 April, 2000</p> </div> </div>		
8.	Name and daytime telephone number of person to contact in the United Kingdom	HOARTON, L. D. C.	0181 889 6622

Notes

- a) If you need help to fill in this form or you have any questions, please contact the Patent Office on 0645 500505.
- b) Write your answers in capital letters using black ink or you may type them.
- c) If there are more than three inventors, please write the names and addresses of the other inventors on the back of another Patents Form 7/77 and attach it to this form.
- d) When an application does not declare priority, or declares priority from an earlier UK application, you must provide enough copies of this form so that the Patent Office can send one to each inventor who is not an applicant.
- e) Once you have filled in the form you must remember to sign and date it.



Patents Form 7/77

Enter the full names, addresses and postcodes of the inventors in the boxes and underline the surnames

<p><u>SIREAU</u> Jean-Yves Room 81, 2/F Shui on Centre, Wanchai, GPO Box 10285, HONG KONG</p>	<p>7887011001</p>
<p>Patents ADP number (if you know it)</p>	

<p></p>
<p>Patents ADP number (if you know it)</p>

<p></p>
<p>Patents ADP number (if you know it)</p>

Reminder

Have you signed the form?



INVESTOR IN PEOPLE

GB0010270.7

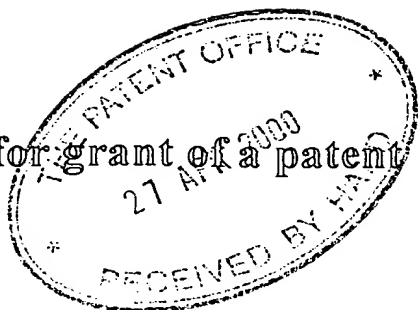
By virtue of a direction given under Section 30 of the Patents Act 1977, the application is proceeding in the name of

FIXED-ODDS GROUP LIMITED
Incorporated in the Bahamas
Charlotte House
Charlotte Street
NASSAU
Bahamas

[ADP No. 08071201001]

THIS PAGE BLANK (USPTO)

Request for grant of a patent



The Patent Office

Concept House
Cardiff Road
Newport
South Wales, NP10 8QQ

27 APR 2000

1. Your reference P14247GB-LH/ATB

2. Patent application number
(The Patent Office will fill in this part)

0010270.7

00425001 55732817-2 000789
P01/7700 0.00-0010270.7

3. Full name, address and postcode of the or of
each applicant (underline all surnames)

Exbet.com Ltd.,
Charlotte House,
Charlotte Street,
Nassau,
The Bahamas

Patents ADP number (if you know it)

If the applicant is a corporate body, give the
country/state of its incorporation

The Bahamas

4. Title of the invention

A Betting System and Method

5. Name of your agent (if you have one)

Forrester Ketley & Co.

"Address for service" in the United Kingdom
to which all correspondence should be sent
(including the postcode)

Forrester House
52 Bounds Green Road
London N11 2EY

Patents ADP number (if you know it)

133001

6. If you are declaring priority from one or more
earlier patent applications, give the country
and the date of filing of the or each of these
earlier applications and (if you know it) the or
each application number

Country

Priority application number
(if you know it)

Date of filing
(day/month/year)

Europe

00302530.1

28 March, 2000

7. If this application is divided or otherwise
derived from an earlier UK application,
give the number and the filing date of
the earlier application

Number of earlier application

Date of filing
(day/month/year)

8. Is a statement of inventorship and of right
to grant of a patent required in support of
this request? (Answer "Yes" if:

YES

- a) any applicant named in part 3 is not an inventor, or
 - b) there is an inventor who is not named as an applicant,
or
 - c) any named applicant is a corporate body.
- See note (d))

05/02/01
7887003000
SECTION 30 (1977 ACT) APPLICATION FILED

Patents Form 1/77

Enter the number of sheets for any of the following items you are filing with this form. Do not count copies of the same document.

Continuation sheets of this form	-
Description	21
Claim(s)	8
Abstract	1
Drawing(s)	1

10. If you are also filing any of the following, state how many against each item.

Priority documents	-
Translation of priority documents	-
Statement of inventorship and right to grant of a patent (Patents Form 7/77)	1
Request for preliminary examination and search (Patents Form 9/77)	1
Request for substantive examination (Patents Form 10/77)	1
Any other documents (please specify)	-

11. I/We request the grant of a patent based on the basis of this application

Signature

Forrester Ketley & Co.

Forrester Ketley & Co.

Date

25 April, 2000

12. Name and daytime telephone number of person to contact in the United Kingdom	HOARTON, L. D. C.	0181 889 6622
--	-------------------	---------------

Warning

After an application for a patent has been filed, the Comptroller of the Patent Office will consider whether publication or communication of the invention should be prohibited or restricted under Section 22 of the Patents Act 1977. You will be informed if it is necessary to prohibit or restrict your invention in this way. Furthermore, if you live in the United Kingdom, Section 23 of the Patents Act 1977 stops you from applying for a patent abroad without first getting written permission from the Patent Office unless an application has been filed at least 6 weeks beforehand in the United Kingdom for a patent for the same invention and either no direction prohibiting publication or communication has been given, or any such direction has been revoked.

Notes

- a) if you need help to fill in this form or you have any questions, please contact the Patent Office on 0645 500505.
- b) Write your answers in capital letters using black ink or you may type them.
- c) If there is not enough space for all the relevant details on any part of this form, please continue on a separate sheet of paper and write "see continuation sheet" in the relevant part(s). Any continuation sheet should be attached to this form.
- d) If you have answered "Yes" Patents Form 7/77 will need to be filed.
- e) Once you have filled in the form you must remember to sign and date it.
- f) For details of the fee and ways to pay please contact the Patent Office.

"A Betting System and Method"

THIS INVENTION relates to a betting system and method for buying and selling of fixed-odds financial bets, and in particular to a system by which a user at a remote user terminal may buy and sell fixed-odds financial bets in real-time over the Internet.

Although betting in many diverse forms has been in existence for thousands of years, the concept of a bet on the future performance of one or more financial market indicators is a relatively recent one. Such a bet may take one of two forms, as will be described.

The first form of such a bet (the "spread bet") is one which, if won by the making of a correct prediction, pays out a sum proportional to the market fluctuation. For instance, a speculator may bet that a given stock will fall within a set period of time, and, if this prediction is correct, may receive winnings in direct proportion to the amount by which the stock has fallen in that period of time.

The other form that such a bet may take is known as the "digital option". Digital bets are of the same form as a traditional sporting bet in that the speculator predicts a certain event and receives either a fixed sum of winnings (if that event does occur) or no winnings (if the event does not occur). For instance, a speculator may bet that a certain stock index will rise to a certain level by a certain time. If the named index does reach this level, the speculator wins an agreed amount of money irrespective of any amount by which the index has exceeded the predicted level. It is this type of bet that is known as a "fixed odds" bet.

However, problems face the individual investor who wishes to place bets on the financial markets. The wide universe of financial instruments and derivatives products is typically available only to professional investors who have the financial resources and know-how to access these products.

Problems also face the bookmaker who wishes to offer financial bets to the private investor. These include the fact that financial bookmaking is labour-intensive, with skilled staff being required to constantly adapt the odds offered on an immense variety of possible bets to market conditions that are changing on a minute-by-minute basis.

The average size of a bet placed by an individual customer will, in general, be very small compared to the average size of a typical stock market direct investment. The potential profit to the bookmaker from such a small investment will therefore be too small for it to be economically viable to employ skilled staff to calculate the odds to offer to individual speculators sufficiently quickly.

A further problem facing bookmakers is that it is very difficult to accurately price complicated or unusual bets, and bookmakers typically offer only a few standard bets on a few markets.

It is an object of the present invention to seek to provide a system and method that alleviates some or all of the above problems, and which enables a bookmaker to efficiently offer a wide range of financial bets to speculators wishing to place relatively small bets.

Accordingly, a first aspect of the present invention provides a fixed-odds betting system comprising: a user terminal operable to accept parameters, input

by a user, relating to a fixed-odds bet on an aspect of a financial market; and a central processing machine having a data feed to a source of data concerning a financial market and means operable to calculate the fixed odds for the bet, based on at least some of the parameters input by the user and the data obtained from the data feed.

Advantageously, the user terminal is operable to display the odds calculated by the central processing machine at the user terminal.

Preferably, the data feed to the source of data concerning the financial market comprises at least a data feed to real-time information concerning the financial market.

Conveniently, the data feed to the source of data concerning the financial market comprises at least a data feed to historical data concerning the financial market.

Advantageously, the data feed is connected to the source of data concerning the financial market over a first data communications network.

Preferably, the first data communications network is the Internet or a leased line.

Conveniently, the central processing machine has at least one other data feed to a source of data concerning one or more other financial markets.

Advantageously, the user terminal and the central processing machine are connected to one another via a second data communications network.

Preferably, the second data communications network is the Internet.

Conveniently, the system further comprises a payment system for deducting payment for the bet from the user, the mechanism being linked to the central processing machine.

Advantageously, the payment system for deducting payment from the user includes an E-cash or credit card payment system.

Preferably, the system further comprises an accounting system linked to the central processing machine.

Conveniently, the system further comprises a management terminal operable to provide information regarding the operation of the betting system to an administrator thereof.

Advantageously, the parameters include one or more of the following: the relevant financial market(s); the amount that the user wishes to bet or the amount that the user wishes to win; and one or more barrier or target levels.

Preferably, the system further comprises a storage facility for storing information relating to bets.

Conveniently, the central processing machine includes means to retrieve information stored in the storage facility, and provide information to a user relating to a bet previously placed by the user.

Preferably, the central processing machine includes means to calculate a price at which to offer to purchase the previously placed bet from the user and to display the price calculated by the central processing machine.

Another aspect of the present invention provides a method of operating a fixed-odds betting system, comprising the steps of: providing a user terminal operable to accept parameters relating to a fixed-odds bet on an aspect of a financial market from a user; receiving one or more parameters from the user relating to a fixed-odds bet on an aspect of a financial market; providing a central processing machine; providing a data feed to a source of data concerning a financial market; obtaining data concerning a financial market via the data feed; and the central processing machine calculating a fixed-odds price for the bet based on at least one of the parameters input by the user and the data obtained from the data feed.

Conveniently, the method further comprises the step of displaying the calculated odds to the user.

Advantageously, the method further comprises the step of deducting payment from the user for placing the bet.

Preferably, the step of receiving one or more parameters from the user includes the step of receiving information relating to one or more of the following: the relevant financial market; the amount that the user wishes to win or the amount that the user wishes to bet; and one or more barrier or target levels.

Conveniently, the step of obtaining data concerning the financial market includes the step of obtaining real-time data relating to one or more of the following: market prices; option quotes; interest rates and dividend yields.

Advantageously, the step of obtaining data concerning a financial market includes the step of obtaining historical data relating to market prices.

Preferably, the step of calculating the fixed-odds price comprises the step of calculating an estimate of the future volatility of the financial market.

Conveniently, the method further comprises the step of checking the parameters input by the user for logical inconsistencies therebetween.

Advantageously, the method further comprises the step of checking the opening times of the financial market.

Preferably, the method further comprises the step of providing at least one other data feed to a source of data concerning one or more other financial markets.

Conveniently, the step of receiving parameters from the user includes the step of receiving parameters relating to an aspect of the one or more other financial markets.

Advantageously, the step of calculating the fixed-odds price for the bet includes the step of calculating a correlation matrix containing information concerning the financial market and the one or more other financial markets.

Preferably, the system further comprises the step of providing a storage facility, accessible by the central processing machine, for storing information relating to bets.

Conveniently, the step of calculating odds includes the step of calculating a hedging factor based on information concerning previously placed bets obtained from the storage facility.

Advantageously, the method further comprises the step of the central processing machine calculating a price at which to offer to buy a previously placed bet from the user.

Preferably, the method further comprises the step of providing the price to the user via the user terminal.

A further aspect of the present invention provides a computer program comprising computer program code means adapted to: receive one or more parameters from a user relating to a fixed-odds bet on an aspect of a financial market; obtain data concerning a financial market via a data feed; and calculate a fixed-odds price for the bet based on at least one of the parameters input by the user and the data obtained from the data feed.

Another aspect of the present invention provides a computer program as above embodied on a computer readable medium.

A further aspect of the present invention provides a central processing machine having a data feed to a source of data concerning a financial market, and being operable to calculate fixed odds, based on parameters input by a user and data obtained from the data feed.

Conveniently, the data feed to the source of data concerning the financial market comprises a data feed to at least real-time information concerning the financial market.

Advantageously, the data feed to the source of data concerning the financial market comprises a data feed to at least historical data concerning the financial market.

Preferably, the data feed is connected to the source of data concerning the financial market over a first data communications network.

Conveniently, the first data communications network is the Internet or a leased line.

Advantageously, at least one other data feed is provided to a source of data concerning one or more other financial markets.

Preferably, the central processing machine further comprises a storage facility for storing information relating to bets.

Conveniently, the central processing machine has means to calculate a price at which to offer to purchase a previously placed bet from the user.

Advantageously, the central processing machine further comprises a management terminal operable to display information regarding the operation of the betting system to an administrator thereof.

In order that the present invention may be more readily understood, an embodiment thereof will now be described, by way of example, and with reference to the accompanying Figure which shows a schematic layout of the components of a betting system embodying the present invention.

Turning to the Figure, a central processing machine 1 of a betting system embodying the present invention comprises a server running a server operating system. A computer program embodying an aspect of the present invention is loaded onto the central processing machine 1, as will be described in greater detail below.

The central processing machine 1 is linked via a first data communications network 2 to a plurality of user terminals 3. Preferably, the first network 2 is the Internet. The user terminals comprise PC's, or other suitable machines, running an appropriate operating system to interface with prospective customers, for instance a Windows or UNIX type operating system.

The central processing machine 1 is further connected via a second data communications network 4 to two data feeds, one of which is a data feed 5 to a source of real-time market information, and the other of which is a data feed 6 to a source of historical market information. Preferably, the second network 4 is the Internet or a leased line. Examples of real-time market quotes data feeds are those provided by financial information providers such as Reuters, Bloomberg, Bridge, DBC, etc. The primary requirement for this data link is that it should be real-time, which is to say that the quotes retrieved via the data link are up-to-the-second real-time market quotes.

The betting system further comprises a data storage facility 7, comprising a file server operable to store information concerning placed, pending and expired bets on one or more disks. The data storage facility is connected to an archival data storage facility 8, which is operable to retain information on a plurality of tapes or other long-term storage media.

The betting system includes an E-cash or credit card payment system 9, which is linked to the central processing machine 1 by a third data communications network 10. An accounting system 11 is also included in the betting system, this accounting system being directly linked to the central processing machine 1.

A management terminal 12 also comprises part of the betting system. This management terminal 12 is linked to the central processing machine 1 via a fourth data communications network 13, which is preferably the Internet.

In operation, an individual user is able to log on to a user terminal 3 for the purpose of placing a fixed-odds financial bet. A user-id and password, provided to the individual by the administrator of the betting system, may be required to do so. In practice, the user terminal 3 may comprise a dedicated terminal in a public betting facility, or may alternatively comprise the user's own PC.

When the user attempts to log on to the betting system at the user terminal 3, the user terminal 3 connects to the central processing machine 1 via the first network 2. If a password is required, the password must be accepted by the central processing machine 1 before the user is allowed to log on to the betting system.

The user is now able to place a fixed-odds financial bet using the betting system. The user terminal 3 presents the user with a suitable interface for doing so, this interface comprising a number of menus or the like through which the user may navigate to glean information or select bet parameters. Bet parameters that the user may select may include, among others: the financial market(s) upon which the bet is to be based (for instance a foreign exchange rate); the amount that the user wishes to bet or the amount that the user wishes to win; or

one or more barrier or target levels (relating to market performance) which set a threshold for the financial market parameter being monitored. Once the bet parameters are decided upon by the user, these parameters are submitted to the central processing machine 1 via the first network 2.

The first step performed by the central processing machine 1 upon receipt of the bet parameters from the user terminal 3 is to ascertain whether or not the bet defined by the bet parameters is within reasonable reach of current market prices. In order to decide whether or not this is the case, the central processing machine 1 gathers information concerning the current market prices from the data feed 5 to the source of real-time market information. If the data derived therefrom indicates that there is no realistic possibility of the market price changing with the rapidity required by the bet, then the central processing machine 1 will reject the bet.

Next, the bet parameters input by the user are checked by the central processing machine 1 for logical inconsistencies, and the bet is rejected if such inconsistencies are found to be present. For instance, if a user has input bet parameters defining a bet that a certain financial index will remain between a high value of 110 and a low value of 120, the central processing machine 1 will determine that the bet is logically inconsistent and reject the bet.

A further step performed by the central processing machine 1 on receipt of a set of bet parameters from a user terminal 3 is to check the opening times of the relevant financial markets. The central processing machine 1 has, for this purpose, a link to a source of information containing the opening hours and public holidays of all of the markets upon which bets are offered. If a user is allowed to bet upon the performance of a market during a period for which that

market is closed, the user gains an unfair advantage and thus such a bet would be rejected.

Once it has been established by the central processing machine 1 that the bet parameters input by the user define a valid bet, the next step is to determine the real-time raw market values from which to calculate the price of the bet. In order to do this, the central processing machine 1 accesses the data feed 5 to the source of real-time market information. The data derived therefrom may include current market prices, option quotes, interest rate levels, dividend yields (in the case of stocks or stock indices), or carrying costs (i.e., storage, delivery or insurance costs, in the case of commodities). The central processing machine 1 may also access the data feed 6 to the source of historical market information, and the data gathered therefrom may include historical closing prices for the relevant markets.

Once a set of valid bet parameters have been received by the central processing machine 1 and the relevant information has been gathered from the data feeds 5, 6, the central processing machine 1 uses the information to calculate the odds that will be offered to the user for the bet.

The first step in the process is to calculate the implied volatility of the or each market upon which the bet is based. The volatility of a market is defined as the amount by which the market fluctuates during a given period, and is often defined as the annualised standard deviation of the natural logarithm of the price returns of the daily closing values of the market.

The implied volatility is the market volatility that the listed options market implies for the future, market volatility being a major factor in the determination of the price of an option. If the price of the listed options relating

to a given market for a given time period is known, this figure can be reverse-engineered to calculate the future volatility of the market implied by that option price. Various techniques exist for this reverse engineering operation, the most commonly used of which is an algorithm based on the Black and Scholes option pricing model, however the skilled person will realise that any of several alternative algorithms may be used instead.

A standard option pricing model such as the Black and Scholes model assumes that the financial markets follow a log-normal distribution. This assumption does not, however, accurately reflect the market panics (like the 1987 stock market crash), which occur with a higher frequency than would be expected in a purely lognormal distribution. To adjust for the “fatter tails” of the real distribution of market returns, the concept of “volatility smile” is introduced, whereby options with different strike prices trade at different implied volatilities. Options with different expiry dates also trade at different implied volatilities, reflecting different expectations of market volatility over different time periods. Since there will likely not be any option with exactly the same expiry date and target price as the bet, interpolation will be used to arrive at the best estimate of the volatility for the bet.

To calculate the volatility to be used to price the bet, options prices are gathered from the data feed 5 to the real-time source of market information. The implied volatilities of the options with strike prices closest to the barrier or target level of the bet, and with expiry dates closest to the expiry date of the bet, are computed. These implied volatility points are then interpolated to arrive at the implied volatility most appropriate for the expiry date and barrier or target level of the bet (if the bet has several barrier or target levels, the level that will lead to the highest selling price for the bet may be used). This

interpolated implied volatility is used by the central processing machine 1 to calculate the odds for the bet.

It is also necessary for the central processing machine 1 to take into account the growth of the market or markets in question. In order to derive this value, the interest rate and other components of the carrying cost for each market (extracted from the data feed 5 to the real-time source of market information) are required. For stocks or stock indices, the growth of the market is typically approximated as being the interest rate minus the annualised dividend yield. In a similar manner to that described above, the interest rate for an arbitrary time period may be estimated by interpolating between the deposit rates for earlier and later maturities to arrive at an appropriate value. For foreign exchange rates, the growth rate is defined as the difference between the deposit rates in each currency, and for other markets such as commodities, the growth rate incorporates factors such as storage or delivery costs, and insurance fees.

A complex bet may involve predictions on the performances of several different markets, and if such a bet is placed then a correlation matrix for these different markets will need to be computed. Such a correlation matrix is computed by calculating the correlation coefficients of the relevant markets over a period of historical data obtained from the data feed 6 to the source of historical market information. Ideally, this time period is in proportion to the length of the bet.

Once all of the necessary information has been gathered or computed by the central processing machine 1, the central processing machine 1 proceeds to calculate the odds for the bet defined by the bet parameters. There are various ways in which this may be performed for each type of bet that might be placed by the user. Common bets that might be placed include:

an “up/down” bet that a given market will be above or below a given level on a given date;

an “expiry range” bet that a given market will be between two given levels on a given date;

a “rainbow” bet, which is essentially a multi-market expiry range bet;

a “bullseye” bet that a given market will have an exactly given value on a given date;

a “one-touch” bet that a given market will touch a given barrier level at some point before the expiry of the bet;

a “no-touch” bet that a given market will not touch a given barrier level at any point before the expiry of the bet;

a “range” bet that a given market will touch neither of two given barrier levels at any point before the expiry of the bet;

a “double one-touch” bet that a given market will touch both of two given barrier levels at some point before the expiry of the bet ;

a “win”, “place” or “show” bet that a market will be respectively the best, or within the top two best, or top three best, performing markets (in percentage terms) over a given period ; and

a “quinella”, “tierce” or “exacta” bet defined from their racetrack equivalents.

An example of how the price of an expiry range bet might be calculated is as follows:

The formula for the underlying asset price S is given by:

$$dS = \mu S dt + \sigma S dz$$

where σ is the volatility and μ is the growth rate. Solving this equation with $z(t)$ being normally distributed with zero mean and variance τ :

$$S(\tau) = S \exp((\mu - \sigma^2/2)\tau + \sigma z(t))$$

Let ρ be the probability of success of a bet in this model at expiry time τ . The present value of this bet thus becomes:

$$P = \exp(-r\tau)\rho$$

where P is the present value (or fair price) of the bet. We now denote:

$$X_\tau = \log (S(\tau)/S)$$

and

$$v = r - g - \sigma^2/2$$

Then

$$x = \frac{X_\tau - v\tau}{\sigma\sqrt{\tau}}$$

is normally distributed with probability density:

$$f(x) = \frac{1}{\sqrt{2\pi}} \exp\left(-\frac{x^2}{2}\right)$$

We denote:

$$N(x) = \int_{-\infty}^x f(y) dy$$

where $N(x)$ is the cumulative probability of the normal distribution. Let S be the initial market price, and let

$$a = \log\left(\frac{U}{S}\right) \text{ and } b = \log\left(\frac{D}{S}\right)$$

where U and D are the up and down barriers of the bet respectively. The price of the expiry range bet defined by U and D is then given by:

$$P = e^{-r\tau} \left[N\left(\frac{a - v\tau}{\sigma\sqrt{\tau}}\right) - N\left(\frac{b - v\tau}{\sigma\sqrt{\tau}}\right) \right].$$

Other formulae for different types of bets may readily be derived by employing the same principles. The type of formula employed is also not essential to the working of the system - many different methods of calculating odds exist, and any of these may be used in the system of the present invention.

Once the price of the bet defined by the bet parameters input by the user is determined, a house mark-up is added and the bet is offered to the user via the user terminal 3. Since the system operates on real-time values derived from the constantly fluctuating markets, the customer is allowed only a short time in which to decide whether or not to purchase the bet at the calculated price. This time period is, preferably, no more than thirty to sixty seconds, and the offer is withdrawn after this time.

If the user decides to purchase the bet, he or she will be prompted to input a username and password (if these were not input at an earlier stage). This information is verified by the central processing machine 1 and, if it is accepted, will check the credit balance of the user on the accounting system 11. If this reveals that the user has sufficient funds to purchase the bet, the transaction with the user is effected and the bet is recorded on the data storage facility 7.

Each user of the system may, on entering his or her valid username and password, view a list of outstanding bets that he or she has placed on a user terminal 3. In order to provide this list, the central processing machine 1 retrieves information regarding the user's previously placed bets from the data storage facility 7. The central processing machine 1 must, for each previously placed bet, determine whether the bet has: already expired or fulfilled the conditions of the bet so that the user has won the bet; already expired or contravened the conditions of the bet so that the user has lost the bet; or has not yet reached the date or conditions of expiry. The central processing machine 1 derives this information by comparing the bet parameters with both real-time market information and historical market information for the relevant time period obtained via the data feeds 5, 6. The status of each previously placed bet

is passed to the user terminal 3 for display to the user. If the user has won any of the bets, the central processing machine 1 instructs the accounting system 11 to credit the user's account accordingly.

The system may also be provided with a facility to offer to buy an unexpired bet back from the user. The price that is offered for a bet is calculated by first determining the value of the bet using similar techniques to those described above, with a house mark-up being included in the price. As described above, the user is given no more than thirty to sixty seconds to decide whether or not to accept the price offered before the offer is withdrawn.

All of the transactions between the central processing machine 1 and the users of the system may be monitored by an administrator of the system at the management terminal 12. This facility allows the administrator to ensure that the system is running smoothly and that the algorithms and/or models employed by the central processing machine 1 are producing appropriate results.

As a further consideration, the administrator of the system may be concerned about his or her financial exposure and the system may accordingly include means to inform the administrator, in real-time, of the financial exposure via the management terminal 12. This facility allows the administrator to "hedge" in the futures and options markets. There are four types of hedging ratio commonly used, namely the delta, theta, gamma and vega hedging ratios. These ratios, along with the appropriate hedging techniques, are well known in the art.

In an alternative embodiment of the invention the E-cash or credit card payment system 9 is replaced by a system that operates with "virtual" or "fantasy" money instead of real funds. In such an embodiment, bettors are allocated an

initial amount of "fantasy" money to purchase bets. Successful bettors have the chance to win prizes or other benefits.

As a further consideration, whether or not the payment system comprises real or "fantasy" money, the administrator of the system may wish to track the bettors who are consistently successful at forecasting the direction of the financial markets. The administrator knows that under the assumption of efficient markets, no person may consistently forecast the financial markets, and therefore successful bettors are simply those that have been successful by chance. However, tracking successful bettors may provide useful information for the administrator, such as useful clues for tracking down problems with this embodiment of the invention. The administrator may also sell or provide the information comprised of the ongoing bets of the successful bettors, to third parties who may choose to use or rely upon this information on the belief that the successful bettors have a special gift rather than being simply lucky.

The betting system embodying the present invention for calculating the fixed-price odds that may be offered to a prospective bettor is particularly well-suited to bets placed on the financial markets since the calculation of fixed-price odds is sufficiently difficult, time consuming and computationally intensive to make calculation thereof by humans inefficient for all but the largest of bets. The system described herein allows an administrator of the system to offer reasonable and well-calculated odds in real-time to individual speculators betting small sums of money on an almost unlimited number of eventualities, without the need to employ highly-skilled staff to do so. This service has not been available in the past.

In the present specification "comprises" means "includes or consists of" and "comprising" means "including or consisting of".

The features disclosed in the foregoing description, or the following claims, or the accompanying drawings, expressed in their specific forms or in terms of a means for performing the disclosed function, or a method or process for attaining the disclosed result, as appropriate, may, separately, or in any combination of such features, be utilised for realising the invention in diverse forms thereof.

CLAIMS:

1. A fixed-odds betting system comprising:
a user terminal operable to accept parameters, input by a user, relating to a fixed-odds bet on an aspect of a financial market; and
a central processing machine having a data feed to a source of data concerning a financial market and means operable to calculate the fixed odds for the bet, based on at least some of the parameters input by the user and the data obtained from the data feed.
2. A system according to Claim 1, wherein the user terminal is operable to display the odds calculated by the central processing machine at the user terminal.
3. A system according to Claim 1 or 2, wherein the data feed to the source of data concerning the financial market comprises at least a data feed to real-time information concerning the financial market.
4. A system according to any preceding claim wherein the data feed to the source of data concerning the financial market comprises at least a data feed to historical data concerning the financial market.
5. A system according to any one of Claims 1 to 4, wherein the data feed is connected to the source of data concerning the financial market over a first data communications network.
6. A system according to any preceding claim, wherein the first data communications network is the Internet or a leased line.

7. A system according to any preceding claim, wherein the central processing machine has at least one other data feed to a source of data concerning one or more other financial markets.
8. A system according to any preceding claim, wherein the user terminal and the central processing machine are connected to one another via a second data communications network.
9. A system according to Claim 8, wherein the second data communications network is the Internet.
10. A system according to any preceding claim, further comprising a payment system for deducting payment for the bet from the user, the mechanism being linked to the central processing machine.
11. A system according to Claim 10, wherein the payment system for deducting payment from the user includes an E-cash or credit card payment system.
12. A system according to any preceding claim, further comprising an accounting system linked to the central processing machine.
13. A system according to any one of Claims 1 to 9, further comprising a system for varying an amount of virtual money assigned to the user in response to the outcome of the bet.
14. A system according to any preceding claim, further comprising a management terminal operable to provide information regarding the operation of the betting system to an administrator thereof.

15. A system according to any preceding claim, wherein the parameters include one or more of the following: the relevant financial market; the amount that the user wishes to bet or the amount that the user wishes to win; and one or more barrier or target levels.

16. A system according to any preceding claim, further comprising a storage facility for storing information relating to bets.

17. A system according to Claim 16, wherein the central processing machine includes means to retrieve information stored in the storage facility, and provide information to a user relating to a bet previously placed by the user.

18. A system according to Claim 17, wherein the central processing machine includes means to calculate a price at which to offer to purchase the previously placed bet from the user and to display the price calculated by the central processing machine.

19. A method of operating a fixed-odds betting system, comprising the steps of:

providing a user terminal operable to accept parameters relating to a fixed-odds bet on an aspect of a financial market from a user;

receiving one or more parameters from the user relating to a fixed-odds bet on an aspect of a financial market;

providing a central processing machine;

providing a data feed to a source of data concerning a financial market;

obtaining data concerning a financial market via the data feed; and

the central processing machine calculating a fixed-odds price for the bet based on at least one of the parameters input by the user and the data obtained from the data feed.

20. A method according to Claim 19, further comprising the step of displaying the calculated odds to the user.

21. A method according to Claim 19 or 20, further comprising the step of deducting payment from the user for placing the bet.

22. A method according to Claim 19 or 20, further comprising the step of varying an amount of virtual money assigned to the user in response to the outcome of the bet.

23. A method according to any one of Claims 19 to 22, wherein the step of receiving one or more parameters from the user includes the step of receiving information relating to one or more of the following: the relevant financial market; the amount that the user wishes to win or the amount that the user wishes to bet; and one or more barrier or target levels.

24. A method according to any one of Claims 19 to 23, wherein the step of obtaining data concerning the financial market includes the step of obtaining real-time data relating to one or more of the following: market prices; option quotes; interest rates, dividend yields and other components of the market carrying cost, if applicable.

25. A method according to any one of Claims 19 to 24, wherein the step of obtaining data concerning a financial market includes the step of obtaining historical data relating to market prices.

26. A method according to any one of Claims 19 to 25, wherein the step of calculating the fixed-odds price comprises the step of calculating an estimate of the future volatility of the financial market.
27. A method according to any one of Claims 19 to 26, further comprising the step of checking the parameters input by the user for logical inconsistencies therebetween.
28. A method according to any one of Claims 19 to 27, further comprising the step of checking the opening times of the financial market.
29. A method according to any one of Claims 19 to 28, further comprising the step of providing at least one other data feed to a source of data concerning one or more other financial markets.
30. A method according to Claim 29, wherein the step of receiving parameters from the user includes the step of receiving parameters relating to an aspect of the one or more other financial markets.
31. A method according to Claim 30, wherein the step of calculating the fixed-odds price for the bet includes the step of calculating a correlation matrix containing information concerning the financial market and the one or more other financial markets.
32. A method according to any one of Claims 19 to 31, further comprising the step of providing a storage facility, accessible by the central processing machine, for storing information relating to bets.

33. A method according to Claim 32, wherein the step of calculating odds includes the step of calculating a hedging factor based on information concerning previously placed bets obtained from the storage facility.

34. A method according to Claim 32 or 33, further comprising the step of the central processing machine calculating a price at which to offer to buy a previously placed bet from the user.

35. A method according to Claim 34, further comprising the step of providing the price to the user via the user terminal.

36. A computer program comprising computer program code means adapted to:

receive one or more parameters from a user relating to a fixed-odds bet on an aspect of a financial market;

obtain data concerning a financial market via a data feed; and

calculate a fixed-odds price for the bet based on at least one of the parameters input by the user and the data obtained from the data feed.

37. A computer program as claimed in Claim 36 embodied on a computer readable medium.

38. A central processing machine having a data feed to a source of data concerning a financial market, and being operable to calculate fixed odds, based on parameters input by a user and data obtained from the data feed.

39. A central processing machine according to Claim 38, wherein the data feed to the source of data concerning the financial market comprises a data feed to at least real-time information concerning the financial market.

40. A central processing machine according to Claim 38 or 39 wherein the data feed to the source of data concerning the financial market comprises a data feed to at least historical data concerning the financial market.
41. A central processing machine according to any one of Claims 38 to 40, wherein the data feed is connected to the source of data concerning the financial market over a first data communications network.
42. A central processing machine according to any one of Claims 38 to 41, wherein the first data communications network is the Internet or a leased line.
43. A central processing machine according to any one of Claims 38 to 42, having at least one other data feed to a source of data concerning one or more other financial markets.
44. A central processing machine according to any one of Claims 38 to 43, further comprising a storage facility for storing information relating to bets.
45. A central processing machine according to Claim 44, having means to calculate a price at which to offer to purchase a previously placed bet from the user.
46. A central processing machine according to any one of Claims 38 to 45, further comprising a management terminal operable to display information regarding the operation of the betting system to an administrator thereof.
47. A method of operating a betting system, comprising the steps of:
storing predictions made by multiple bettors;

comparing the predictions to the actual outcomes of the events to which the bets relate; and

identifying at least one successful bettor whose predictions are consistently similar to the actual outcomes.

48. A method according to Claim 47, further comprising the step of offering information comprising subsequent predictions made by the at least one successful bettor to a third party.

49. A method according to Claim 47 or 48, wherein the betting system is the betting system claimed in any one of Claims 1 to 18.

50. A betting system substantially as hereinbefore described with reference to the accompanying drawing.

51. A method substantially as hereinbefore described with reference to the accompanying drawing.

52. A computer program substantially as hereinbefore described with reference to the accompanying drawing.

53. A central processing machine substantially as hereinbefore described with reference to the accompanying drawing.

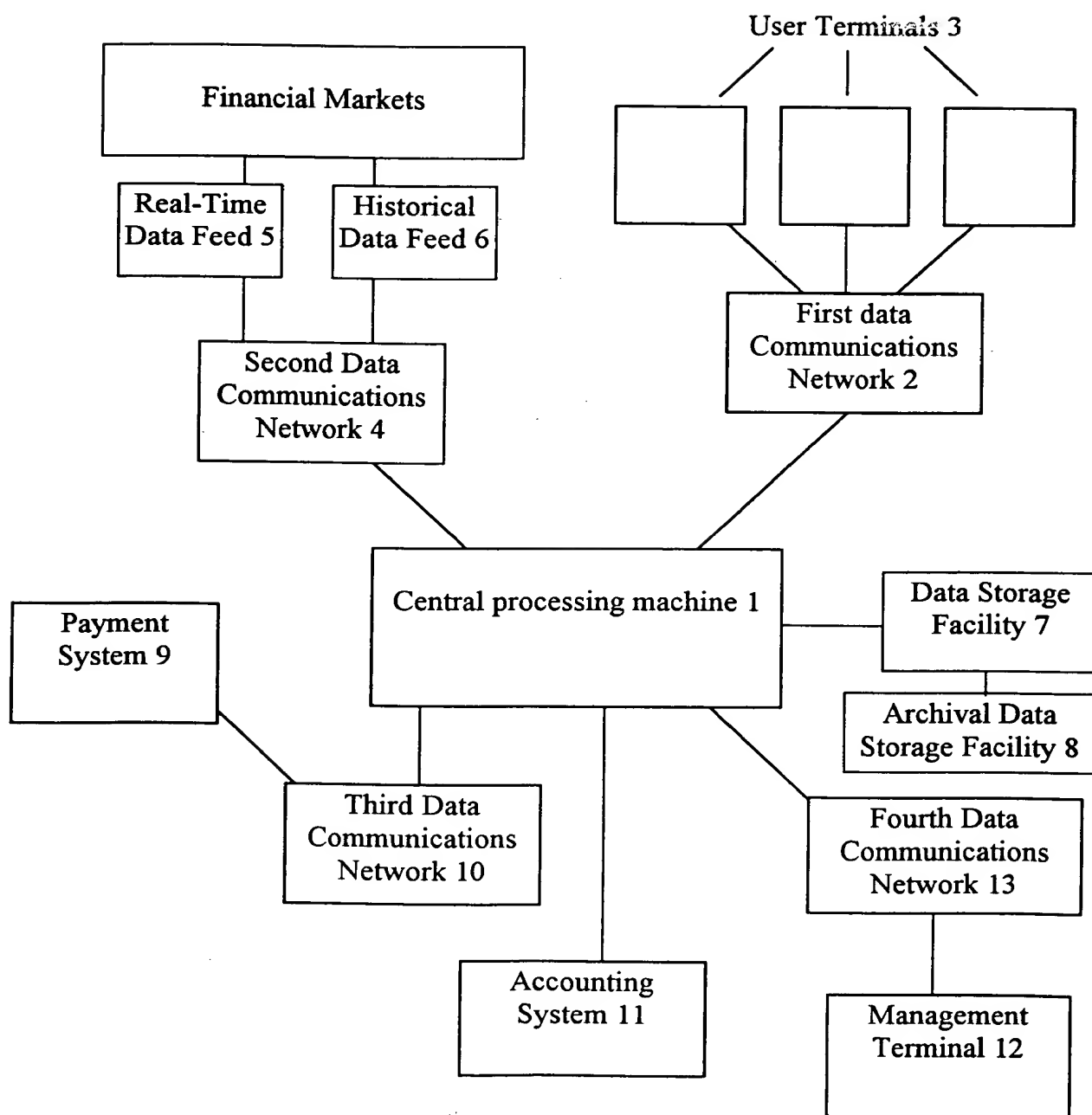
54. Any novel feature or combination of featured disclosed herein.

ABSTRACT

A fixed-odds betting system comprising: a user terminal operable to accept parameters, input by a user, relating to a fixed-odds bet on an aspect of a financial market; and a central processing machine having a data feed to a source of data concerning a financial market and means operable to calculate the fixed odds for the bet, based on at least some of the parameters input by the user and the data obtained from the data feed.

[The Figure]

The Figure



THIS PAGE BLANK (USPTO)